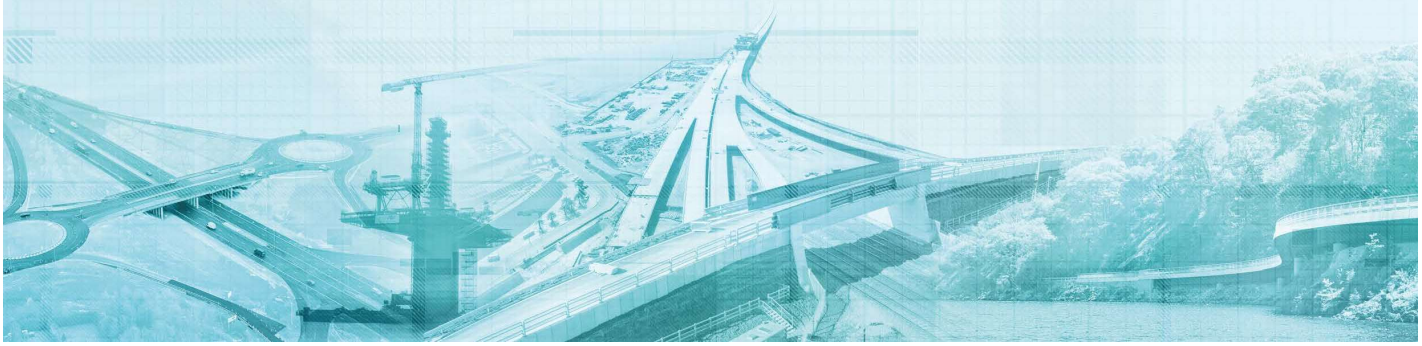
Bean Tunnel

Written Landscape Specification

Kent County Council

Document no: BRT-TG-XX-ZZ-SH-LS-3000

Revision: P03 Date: 23/06/2021



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Document Issue Record

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P01	15.03.21	First Issue	JC	LH	JC
P02	06.04.21	Amended to reflect updated Landscape Layout Plan	JC	LH	JC
P03	23.06.21	Amended to reflect revised locations for tree planting at Lake 5	JC	LH	JC

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1. Introduction

This written landscape specification has been produced to provide the detailed specification for all soft planting operations set out in drawings BRT-TG-XX-ZZ-DR-LS-3001 'Landscape Plan Layout' and BRT-TG-XX-ZZ-DR-LS-3002 'Lake 5 Landscape Plan Layout' (See Section 6, Appendix 3 ad 4) for the Bean Road Tunnel works at Blue Water, herein referred to as 'the Development'.

Condition 19 of planning approval notice DA/19/1549 specifies a need for a landscape scheme to be approved in advance of the occupation/use of the Development.

Condition 19 states the following:

Within 3 months of commencement of the development, details of all hard and soft landscaping and fencing details shall be submitted for the prior written approval of the County Planning Authority and such scheme shall include, amongst other matters, details of the following:

- *the existing trees, shrubs and hedges to be retained and the measures to be taken to provide for the protection thereof during the works hereby permitted;*
- *all trees, shrubs, hedges and other vegetation proposed to be removed;*
- *the provision of new trees, shrubs, hedges and grassed areas, together with the details of the native species and method of planting to be adopted;*
- *details of planting suitable to attract bees for pollination;*
- *details of all fencing, gates and other means of enclosure;*
- *details of materials and finishes to all paved areas;*
- *details of measures to prevent the creation of a desire line as a result of the development;*
- *a programme of maintenance for a period of not less than 5 years;*

and upon approval such scheme shall be implemented as approved within the first planting season following the completion of the development hereby permitted.

Reason: In the interests of visual amenity and in order to achieve high quality sustainable development.

All hard landscaping and fencing have been detailed in the following drawings and are provided in section 6 of this report. These drawings should be read in conjunction with this report to support the full discharge of the above condition:

- BRT-TG-XX-ZZ-DR-HI-0701 'Highways Pavement Plan Layout';
- BRT-TG-XX-ZZ-DR-HI-1101 'Highways Kerbs and Footway Plan Layout';

- BRT-TG-XX-ZZ-DR-HI-0301 'Highways Fencing Plan layout'; and
- BRT-TG-XX-ZZ-DR-HI-0311 'Highways Fencing Details'.

This document will be adhered to by the Projects' personnel, Principal Contractor and sub-contractors involved with construction activities carried out in relation to the Development.

The approved version of this Written Landscaping Scheme will be adopted and implemented by the Projects' personnel, the appointed Principal Contractor and all sub-contractors for the Development works. Minor changes may be made to this document by the Principal Contractor during construction phase. However, changes of a material nature will be agreed with the Kent County Council and stakeholders as relevant.

1.1. Relevant Guidance

The landscape works set out in this document should be read in conjunction with the following guidance, regulations and codes of good practice (or, otherwise, updated/superseded):

- National Joint Utilities Volume 4 (2007) Guidelines for the planning, installation and maintenance of utility apparatus in proximity to trees. Issue 2;
- British Standard (BS) 5837:2012 Trees in relation to design, demolition and construction – Recommendations;
- BS 4428:1989 Code of practice for general landscape operations (excluding hard surfaces);
- BS 3998:2010 Tree work. Recommendations;
- BS 8545:2014 - Trees: From Nursery to Independence in the Landscape
- BS 3936-1:1992 Nursery stock – Specification for trees and shrubs;
- BS 3882:2015 - Specification for topsoil;
- Control of Pesticides Regulations 1986 (COPR) (as amended 1997); and
- Forestry Commission (1999) Using local stock for planting native trees and shrubs: Practice Note.

2. Description of Works

Plans are underway for a Garden City at Ebbsfleet (east of Bluewater Shopping Centre, Dartford), with an expected provision of up to 15,000 new homes based predominantly in brownfield land (former quarries). Kent County Council has proposed for a Fastrack bus service, to connect these new developments to existing housing, businesses and leisure locations in Dartford.

Bean Tunnel is a proposed development to provide a Fastrack busway and a shared footway/cycleway route linking Eastern Quarry (proposed location for the Garden City) and Bluewater. This development will comprise of a new bore tunnel (Bean Tunnel) and associated road works to include bi-directional bus, cycling and pedestrian access between Eastern Quarry and Bluewater. The new tunnel will run through the chalk spine, under the existing B255 route. The development location is shown on drawing B2350500-JAC-DRG-HA-0000 'Location Plan' in Appendix 1.

The existing northbound Bluewater Parkway road, which links the Northern and Southern roundabout, will be widened from two lanes to incorporate a third lane assigned for bus only use. Other associated works to take place will include new signage, signalling, lighting, landscape and drainage works together with connecting highway junctions at each end, including utilities.

Two haulage tunnels were constructed through the chalk spine supporting B255 Bean Road to facilitate earthworks movements during the construction of Bluewater Shopping Centre during the mid-1990's. These are located to the south of the proposed new Bean Tunnel, which are currently not in use but are inhabited by bats. There are proposals to retain one of the tunnels for bat conservation and to infill the other tunnel, to reduce maintenance and potential risk of exposure to unauthorised access.

Currently a pond is located to the west side of the new tunnel. A wildlife corridor and twin pipes are proposed to go cross underneath the road to maintain water flow and wildlife movement in the pond. Twin pipes are proposed on the east side of the tunnel where there is an assumed swale running adjacent to the B255.

3. Protection of Existing Trees

3.1. Protective Barriers

As part of the planning approval for the Development, a number of trees and vegetation groups will be removed to facilitate the works, these are illustrated on drawing B2350500-JAC-DRG-HA-0004-0005 'Site Clearance' in Appendix 2.

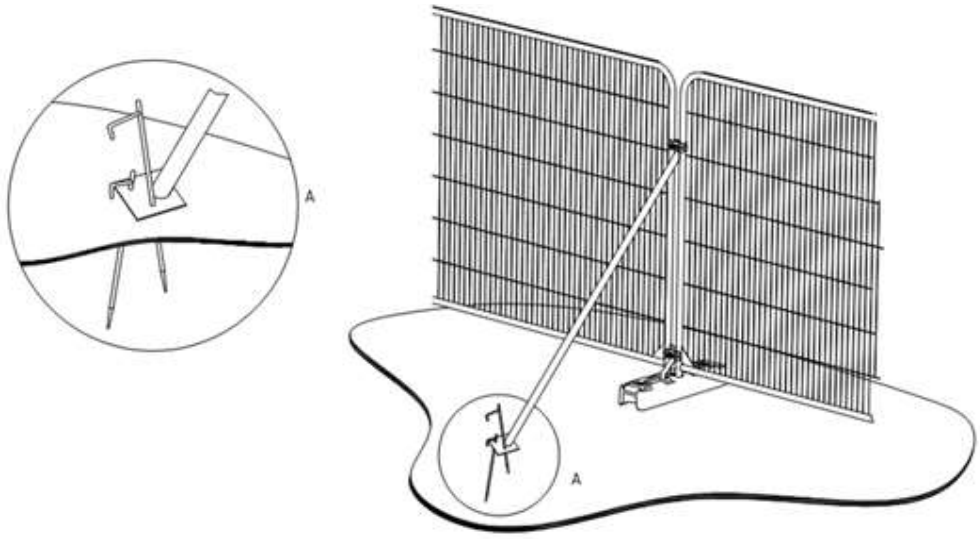
Prior to machinery entering the site for any site clearance, construction or grading purposes, all trees and vegetation groups out with those to be cleared will be fenced off in a continuous line of tree protective fencing for the duration of the construction works associated with the Development.

Where tree removal is required to facilitate the fencing installation, machinery required for tree removal will be permitted to enter site prior to the installation of the tree protection fencing. Care should be taken not to track or compact tree root protection areas of retained trees and storage of materials within tree root protection areas is strictly prohibited.

For the purpose of the installation of the tree protection fencing, the root protection area is defined by the outer extent of the trees canopy.

The specification of proposed tree protection fencing is detailed in Figure 1 below.

Figure 1: Tree protection fencing stabiliser plates and ground pins



a) Stabilizer strut with base plate secured with ground pins

This specification will be used around all retained trees on or immediately adjacent to site and will include additional tree protection signage, as set out in Section 3.2.

3.2. Signage

Signage indicating Tree Protection Zones will be fixed to tree protection fencing in the form of pre-printed laminated waterproof signs, A3 in size. These will be fixed securely to fencing panels on each enclosure at 9m intervals. The signs will be as per Figure 2.

It will be the responsibility of the Principal Contractor to ensure the tree protection signage is installed prior to machinery entering the site for any site clearance, building, construction or grading purposes.

Figure 2 - Tree Protection Fencing Signage

3.3. Protective Barrier Removal

Removal of the Tree protection fencing will only be permitted upon completion of all construction works associated with the Development and once all machinery and materials have left site.

4. Planting and Seeding

4.1. Introduction

The landscape proposals consist of native tree, shrub and herbaceous planting, ornamental planting and native wildflower grassland mixes. This proposed planting reflects both the species and form of that seen locally to the site to complement the wider landscape and increase biodiversity on site.

All landscape operations will be in-line with the relevant British Standard listed in Section 1.1 of this report.

4.2. Planting and Seeding Locations

The location of all proposed planting and seeding areas are illustrated in drawings BRT-TG-XX-ZZ-DR-LS-3001 ‘Landscape Plan Layout’ and BRT-TG-XX-ZZ-DR-LS-3002 ‘Lake 5 Landscape Plan Layout’ and provided in Appendix 3 and 4.

4.3. Restrictions on Planting

Proposed planting may be restricted due to the presence of existing and proposed below and above ground services. Where services are present a reasonable safe distance for landscape contractors when undertaking planting works must be adhered to.

The Principal Contractor is responsible for accurately identifying all information in relation to existing services on site. This includes the accurate location of existing services and identification and agreement of associated easements required by each asset owner and will be shared with the landscape contractor prior to the commencement of landscape works.

4.4. Planting and Seeding Preparation

4.4.1. Clearance

Where required, the Site will be cleared prior to any planting operations being undertaken.

Where existing ground vegetation is retained or has re-established during the construction phase, the following clearance works should be undertaken prior to any planting or seeding works:

- **Tree Planting:** All grass and perennial vegetation within a 250mm radius of the base of each proposed tree should be cleared to ground level including all epicormic and below ground growth;
- **Ornamental Shrub Planting and Reedbed Planting Areas:** All grass and perennial vegetation should be cleared from site to ground level including all epicormic and below ground growth;
- **Proposed Wildflower Seeding Areas:** All grass and perennial vegetation should be cleared to ground level including epicormic and below ground growth;
- **All Areas:** Clear all rubbish and debris and stone pick all stones over 25mm diameter; and
- **Arisings:** Removed from site.

4.4.2. Herbicide Applications

Areas cleared for tree, ornamental shrub planting and wildflower seeding will be treated with two applications of selective broadleaf herbicide prior to planting and seeding. Where necessary, care should be taken to avoid existing bulb and wildflowers and strictly in accordance with the Control of Pesticides Regulations 1986 (COPR) (as amended 1997) (or, otherwise, updated/superseded legislation) and following manufacturer's instructions by qualified staff.

4.4.3. Cultivation

Topsoil should be cultivated in-line with BS 3882: 2015 to a minimum of 400mm over all planting areas and to a fine tilth over all areas to be seeded and include basic levelling with levels graded to fall.

No cultivation should take place in wet/ waterlogged conditions and within the root protection areas of existing trees. Where necessary imported topsoil should be sustainably sourced and must be compliant with the BS 3882: 2015.

4.5. Planting

The handling of plants and planting operations should be in accordance with the requirements and recommendations set out in the relevant British Standards outlined in section 1.1 of this report. The supplier of any plant material to site should be listed in the Horticultural Trade Associations, Nursery Certificate Scheme.

All planting should be carried out during appropriate climatic conditions and where possible during the optimal planting period of October through until the end of March.

Care should be taken to ensure the roots of bareroot specified trees and shrubs do not dry out prior to planting and should be planted as soon as possible after delivery. If this is not possible then rootballed and container grown plants should be specified and stored closed together with the ball or container covered with sand or a moist cloth to prevent drying out.

4.5.1. Plant Staking and Protection

Newly planted trees and shrubs should be staked in-line with BS 4428: 1989 using a single or double cane or stake and appropriate biodegradable tie and rubber buffer to prevent excessive movement during establishment. The stake should be positioned on the windward side of the tree and driven in to the ground vertically.

All newly planted trees and shrubs should be protected from animal damage using a suitable tree or shrub guard. Guards should be biodegradable and pushed up to 2 cm into the ground.

4.5.2. Mulching

All trees and shrub planting areas should be covered using a course bark mulch to a minimum depth of 75mm leaving the stem of the plant clear.

Trees and shrubs should receive a minimum mulch area of 250mm radius from stem.

4.5.3. Tree Planting

Table 1 provides a species list and specification for the 7 no. proposed tree planting associated with the Development works. Locations of all proposed trees are shown on drawing BRT-TG-XX-ZZ-DR-LS-3001 'Landscape Plan Layout' in Appendix 3.

Table 1: Tree Planting Schedule

Species	Specification	Girth (cm)	Height (cm)	Root	No.
Acer campestre	Feathered, 2X	-	150-175	BR	2
Alnus gluntinosa	SLi, 2X	6-8	250-300	BR	1
Betula pendula	Feathered, 2X	-	150-175	BR	1
Crataegus monogyna	Transplant, 1+1	-	100-125	BR	2
Quercus robur	SLi, 2X	6-8	250-300	BR	1

Abbreviations: T= Transplant, Wh= Whip, F= Feathered, SLi= Light Standard, S= Standard, SSe= Select Standard, SHe= Heavy Standard, EHS= Extra Heavy Standard, Adv= Advanced Nursery Stock, SM= Semi-Mature, SSM= Super Semi-Mature, CS= Clear Stem, MS= Multi-Stem, BR= Bare Root, RB= Root Balled, C= Containerised

Table 2 provides a species list and specification for the 50 no. proposed off-site trees at Lake 5, Bluewater. Locations of proposed trees are shown on drawing BRT-TG-XX-ZZ-DR-LS-3002 'Lake 5 Landscape Plan Layout' in Appendix 4.

Table 2: Lake 5 Tree Planting Schedule

Species	Specification	Girth (cm)	Height (cm)	Root	No.
Acer campestre	SLi, 2X	6-8	250-300	BR	10
Betula pendula	Feathered, 2X	-	150-175	BR	15
Betula pubescens	SLi, 2X	6-8	250-300	BR	5
Crataegus monogyna	Transplant, 1+1	-	100-125	BR	10
Quercus robur	SSe, 2X	10-12	300-350	BR	5
Sambucus nigra	Transplant, 1+1	-	100-125	BR	5

Abbreviations: T= Transplant, Wh= Whip, F= Feathered, SLi= Light Standard, S= Standard, SSe= Select Standard, SHe= Heavy Standard, EHS= Extra Heavy Standard, Adv= Advanced Nursery Stock, SM= Semi-Mature, SSM= Super Semi-Mature, CS= Clear Stem, MS= Multi-Stem, BR= Bare Root, RB= Root Balled, C= Containerised

4.5.4. Ornamental Shrub Planting

Table 3 provides a species list and specification for all proposed ornamental shrub planting on site. Locations of ornamental shrub planting is shown on drawing BRT-TG-XX-ZZ-DR-LS-3001 'Landscape Plan Layout' in Appendix 3.

Table 3: Ornamental Shrub Planting Schedule

Species	Pot Size (L)	% in mix	No.
Genista lydia	3	15	8
Hebe 'Green Globe'	3	30	15
Lavandula angustifolia 'Hidcote'	3	35	17
Santolina chamaecyparissus	3	20	10

4.5.5. Reedbed Planting

Table 4 provides a species list and specification for all proposed reedbed planting on site. Locations of reedbed planting is shown on drawing BRT-TG-XX-ZZ-DR-LS-3001 'Landscape Plan Layout' in Appendix 3.

Table 4: Reedbed Planting Schedule

Species	Pot Size (L)	% mix	Notes
Eleocharis palustris	2	15	Marginal plant, to be planted on the edges of the reed bed.
Juncus effusus	2	25	
Myosotis palustris	2	10	Marginal plant, to be planted on the edges of the reed bed.
Phalaris arundinacea	2	15	Marginal plant, to be planted on the edges of the reed bed.
Plantago major	2	25	
Typha angustifolia	2	10	

4.6. Seeding

Seeding areas should be sown with either a suitable amenity grass or wildflower meadow mix that replicates other grassland and wildflower areas local to the Development are. Sowing should be undertaken in accordance with the seed supplier's instructions. Locations for seeding areas

are shown on drawing BRT-TG-XX-ZZ-DR-LS-3001 'Landscape Plan Layout' in Appendix 3. The Amenity Grass Mix should be utilised within a 2m offset of all public highways, cycleways and footpaths with the Wildflower Meadow Mix used within all areas beyond this.

4.6.1. Amenity Grass Seeding

Table 5 provides a general-purpose amenity grass mix containing grassland species and is suggested for use on all proposed amenity grass seed mix areas shown on drawing BRT-TG-XX-ZZ-DR-LS-3001 'Landscape Plan Layout' in Appendix 3.

Table 5 – Amenity Grass Mix Species Schedule

Germinal A22 (Low Maintenance) - Sowing rate: 500kg per HA		
Latin name	**Common name**	**%**
Grasses		
Agrostis castellana	Highland Browntop Bentgrass	5
Festuca rubra rubra	Borluna Slender Creeping Red Fescues	35
Lolium perenne	Cabrio Perennial Ryegrass	20
Lolium perenne	Calico Perennial Ryegrass	40

4.6.2. Wildflower Meadow Seeding

Table 6 provides a general-purpose seed mix containing native wildflower and grassland species and is suggested for use on all proposed meadow seed mix areas shown on drawing BRT-TG-XX-ZZ-DR-LS-3001 'Landscape Plan Layout' in Appendix 3.

Table 6 – Wildflower Meadow Mix Species Schedule

Emorsgate EM6 Meadow Mixture for Chalk & Limestone Soils - Sowing rate: 40kg per HA		
Latin name	**Common name**	**%**
Wild Flowers		
Achillea millefolium	Yarrow	0.2
Agrimonia eupatoria	Agrimonia eupatoria	0.5
Anthyllis vulneraria	Anthyllis vulneraria	1
Centaurea nigra	Common Knapweed	1

Emorsgate EM6 Meadow Mixture for Chalk & Limestone Soils - Sowing rate: 40kg per HA		
Latin name	**Common name**	**%**
Centaurea scabiosa	Greater Knapweed	2.5
Daucus carota	Wild Carrot	1
Echium vulgare	Viper's Bugloss	0.2
Filipendula vulgaris	Dropwort	1
Galium album - (Galium mollugo)	Hedge Bedstraw	0.4
Galium verum	Lady's Bedstraw	0.3
Knautia arvensis	Field Scabious	2.5
Leucanthemum vulgare	Oxeye Daisy - (Moon Daisy)	2.5
Lotus corniculatus	Birdsfoot Trefoil	0.3
Medicago lupulina	Black Medick	0.2
Origanum vulgare	Wild Marjoram	0.5
Pastinaca sativa	Wild Parsnip	0.5
Plantago media	Hoary Plantain	1
Poterium sanguisorba - (Sanguisorba minor)	Salad Burnet	2
Primula veris	Cowslip	0.5
Prunella vulgaris	Selfheal	1.5
Rumex acetosa	Common Sorrel	0.2
Silene vulgaris	Bladder Campion	0.2
Grasses		
Briza media	Quaking Grass	4
Carex flacca	Glaucous Sedge	0.2
Cynosurus cristatus	Crested Dogstail	20

Emorsgate EM6 Meadow Mixture for Chalk & Limestone Soils - Sowing rate: 40kg per HA		
Latin name	**Common name**	**%**
Festuca ovina	Sheep's Fescue	24
Festuca rubra	Red Fescue	24
Koeleria macrantha	Crested Hair-grass	2
Phleum bertolonii	Smaller Cat's-tail	4.6
Trisetum flavescens	Yellow Oat-grass	1.2

4.6.3. Wetland/Pond Meadow Seeding

Table 7 provides a general-purpose seed mix containing native wildflower and grassland species and is suggested for use on all proposed wetland/pond meadow seed mix areas shown on drawing BRT-TG-XX-ZZ-DR-LS-3001 'Landscape Plan Layout' in Appendix 3.

Table 7 – Wetland/Pond Meadow Mix Species Schedule

Emorsgate EP1 Pond Edge Mixture - Sowing rate: 40kg per HA		
Latin name	**Common name**	**%**
Wild Flowers		
Althaea officinalis	Thalictrum flavum	0.1
Barbarea vulgaris	Winter Cress	2.5
Caltha palustris	Marsh Marigold	0.1
Centaurea nigra	Common Knapweed	2.3
Dipsacus pilosus	Small Teasel	0.1
Eupatorium cannabinum	Hemp Agrimony	0.8
Filipendula ulmaria	Meadowsweet	1.5
Iris pseudacorus	Yellow Iris	5.5
Lycopus europaeus	Gypsywort	1
Lysimachia vulgaris	Yellow Loosestrife	0.1

Emorsgate EP1 Pond Edge Mixture - Sowing rate: 40kg per HA		
Latin name	**Common name**	**%**
Lythrum salicaria	Purple Loosestrife	0.7
Oenanthe pimpinelloides	Corky-fruited Water-dropwort	2.4
Prunella vulgaris	Selfheal	2.5
Pulicaria dysenterica	Common Fleabane	0.2
Thalictrum flavum	Common Meadow-rue	0.2
Grasses		
Agrostis capillaris	Common Bent	10
Alopecurus pratensis	Meadow Foxtail (w)	3
Anthoxanthum odoratum	Sweet Vernal-grass (w)	3
Briza media	Quaking Grass (w)	3
Cynosurus cristatus	Crested Dogstail	26
Deschampsia cespitosa	Tufted Hair-grass (w)	2
Festuca rubra	Red Fescue	28
Schedonorus pratensis	Meadow Fescue	15

4.7. Aftercare

To ensure a reasonable level of establishment, newly planted areas of the site should be monitored and maintained for a period of 5 years following completion of planting works associated with each stage of works.

4.7.1. General

All newly planted areas should be maintained free from litter and excessive weed growth (i.e. growth that would be detrimental to the intended planting). Litter, grass cuttings or other deleterious materials should not be deposited on any of the planted areas during the establishment period. Should this occur then the deleterious material should be removed and responsibly disposed of away from site.

4.7.2. Watering

All newly planted areas should be watered immediately after planting and again during periods of drought. This should be done at a rate of 50 litres per tree and at weekly intervals during extended drought.

4.7.3. Pruning

Trees and shrubs should be monitored for any deadwood, crossing branches and should be pruned accordingly to encourage healthy, strong growth.

Trees with clear stems should be maintained as such with any lower branches removed as required.

4.7.4. Weed Control

A weed free area, to a minimum of 250mm around the base of each newly planted tree or shrub, should be maintained during establishment.

Weed control should be undertaken during the growing season, typically from March through to October however this may vary depending of the season and should occur at least 3 times during the season. Any use of herbicide applications should be strictly in accordance with the Control of Pesticides Regulations 1986 (as amended 1997) (or, otherwise, updated/superseded legislation) and following manufacturer's instructions by qualified staff.

4.7.5. Stakes and Protective Guards

Tree and shrub stakes and guards should be inspected twice yearly to ensure they are secure and in place and ties should be adjusted as required to allow for growth. The contractor should ensure that the protective guards do not impeded the natural growth of the plant.

Plant guards and stakes should be removed and responsibly disposed of away from site once the plant has fully established or at the end of the fifth growing season, whichever is sooner.

4.7.6. Mulch

A depth of 75mm if course bark mulch should be maintained at the base of each newly planted tree or shrub. This should be topped up on an annual basis or as required.

4.7.7. Plant Failures

Should any trees or shrubs planted as part of the landscape scheme, within a period of five years after planting, be removed, die or become, seriously damaged or diseased, it is to be replaced in the first available planting season with a specimen of the same species and size as that originally planted.

4.7.8. Mowing - Amenity Grass

The amenity should be maintained in-line with the suppliers' recommendations, typically:

- Following successful establishment, cut regularly to maintain a height of 20-50cm with a minimum of 10 cuts per year, removing arisings from site;
- Carefully dig out or spot treat any residual perennial weeds such as docks as required throughout establishment.

4.7.9. Mowing - Wildflower Seeding

The wildflower meadow should be maintained in-line with the suppliers' recommendations, typically:

- In year 1 following seeding, cut regularly to maintain a height of 40-60cm, removing cuttings from site;
- In years 2-5, cut grass to a height of 50mm in late July/ August after flowering, leaving arisings in situ for a period of 7 days then clear and remove from site. Cut again in October to a height of 50mm; and
- Carefully dig out or spot treat any residual perennial weeds such as docks as required throughout establishment.

4.7.10. Mowing - Wetland/Pond Meadow Seeding

The pond edge seeding should be maintained in-line with the suppliers' recommendations, typically:

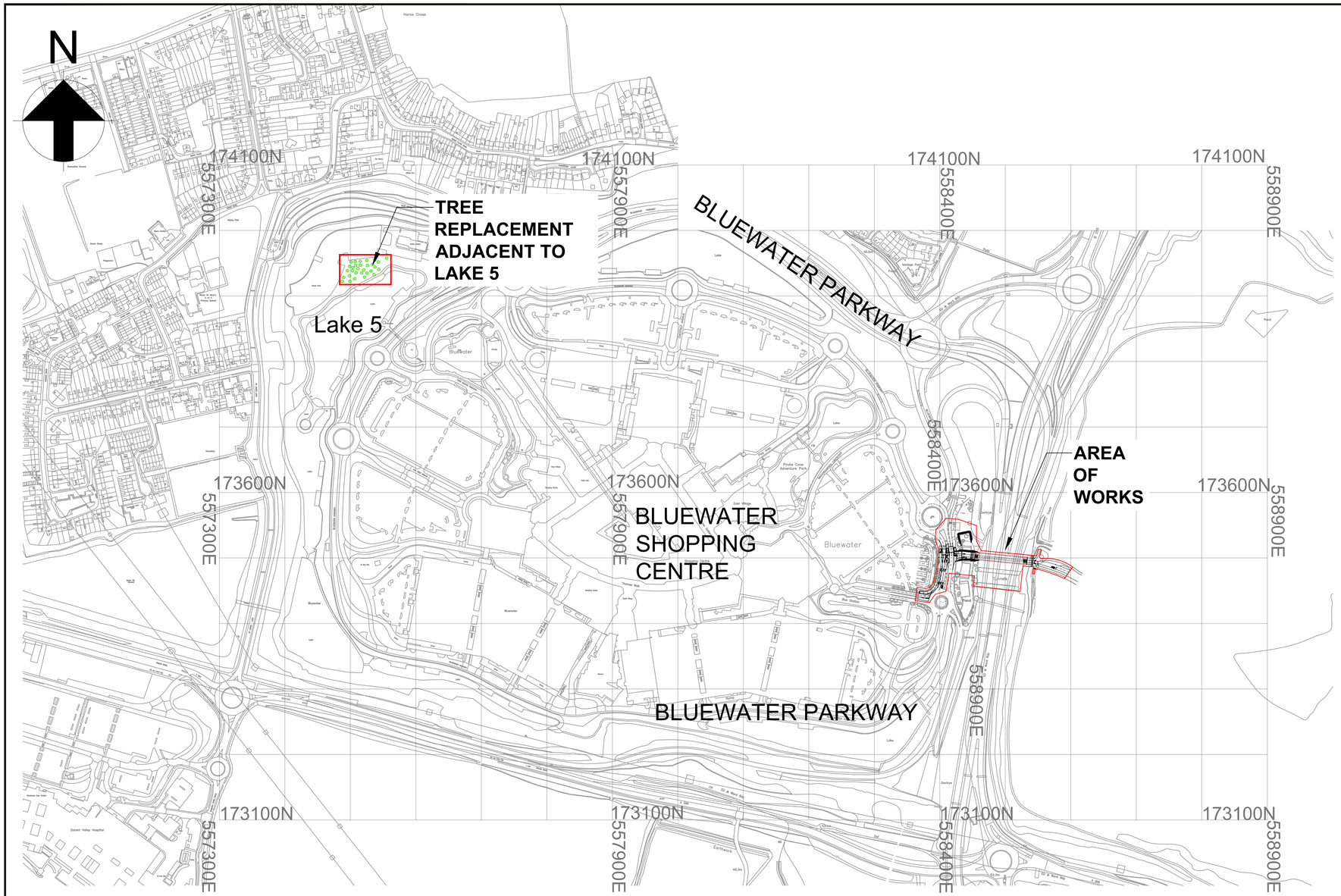
- In year 1 following seeding, cut back to encourage the development of good perennial ground cover
- Once established, cut back and remove short sections of vegetation every 2-3 years on rotation. Dense stands of single species may require selective thinning.
- Carefully dig out or spot treat any residual perennial weeds such as docks as required throughout establishment.

5. Implementation Timeframes

- All proposed tree and shrub planting and meadow seeding works will be implemented in the first available planting season (October – March) following the completion of the Development works.

6. Appendices

6.1. **Appendix 1:** B2350500-JAC-DRG-HA-0000 'Location Plan'



NOTES

1. Drawing to be printed in colour.
2. Do not scale from drawing.

KEY

PLANNING BOUNDARY

Rev	Rev. Date	Purpose of revision	Drawn	Checkd	Rev'd	Apprv'd
P04	SEPT. 2019	PLANNING APPLICATION	WJ	MJ	SY	PW
P03	AUG. 2019	EQ ALIGNMENT CHANGE	IK	MJ	SY	PW
P02	JULY. 2019	PLANNING APPLICATION	IK	MJ	SY	PW
P01	JUNE. 2019	PLANNING APPLICATION	IK	MJ	SY	PW

JACOBS
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Client: Kent County Council

Project: Fastrack Full Network
Bean Road Tunnel

Drawing title: REFERENCE DESIGN LOCATION PLAN

Drawing status: PLANNING APPLICATION

Scale	1:10000@ A4	DO NOT SCALE
Jacobs No.	B2350500	Rev P04
Client no.		

Drawing number: B2350500-JAC-DRG-HA-0000

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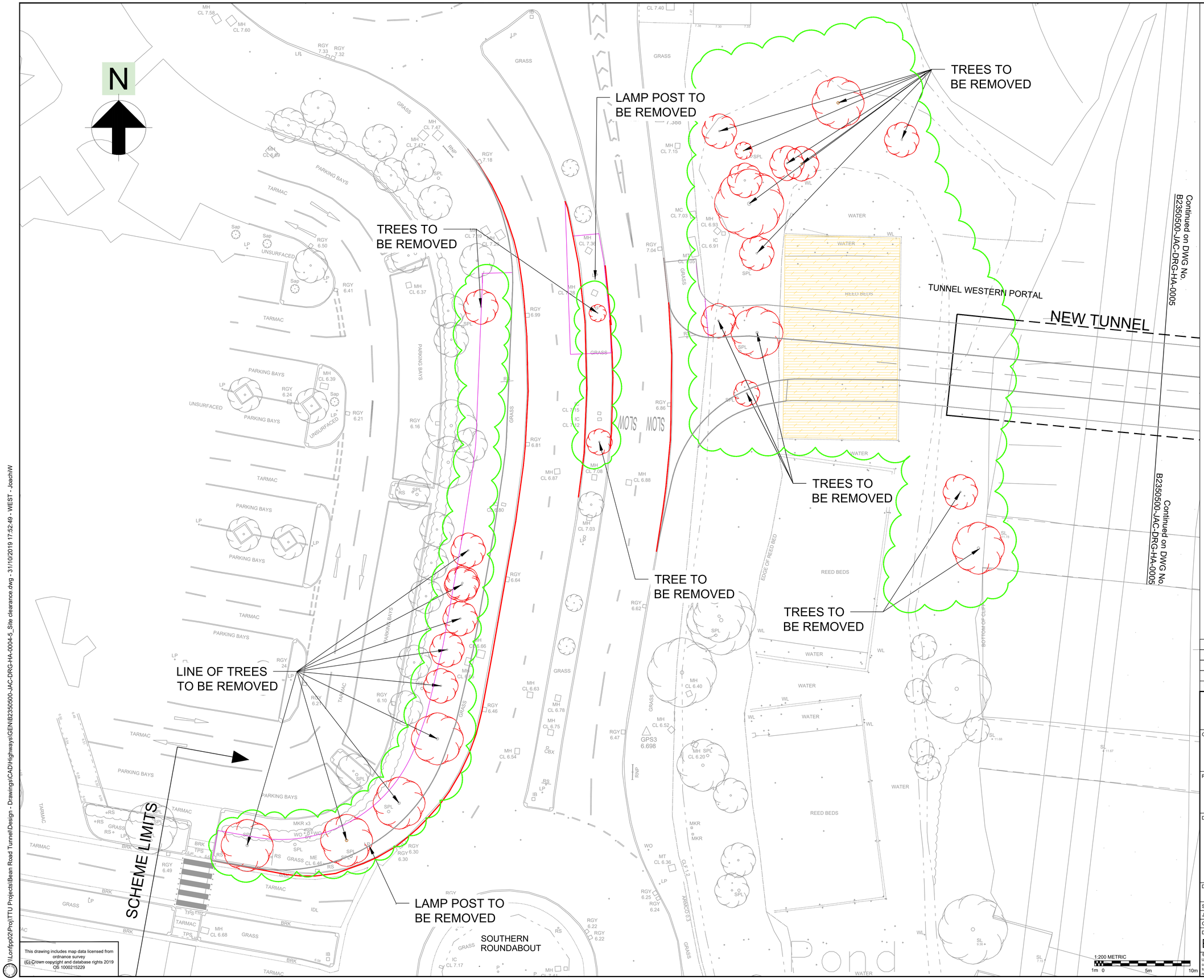
OS 1000215229

1:10000 METRIC

100m 0 500m 1000m

\\Lonfpo02\Proj\TTU Projects\Bean Road Tunnel\Design - Drawings\CAD\Highways\GEN\B2350500-JAC-DRG-HA-0000_Location plan.dwg - 10/10/2019 17:16:49 - PLAN - JoachiW

6.2. Appendix 2: B2350500-JAC-DRG-HA-0004-0005 ‘Site Clearance’



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NOTES

1. Drawing to be printed in colour.
2. Do not scale from drawing.
3. All dimensions are in metres unless stated otherwise.

KEY

- Existing information
- Existing kerb to be removed
- Existing reed bed removal
- Tree to be removed
- Vegetation to be cleared

SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION

In addition to the hazards/risks normally associated with the types of work detailed on this drawing, note the following :

CONSTRUCTION

A000 - Identify and locate existing services. All buried services to be isolated / protected prior to start of works.
Ensure adequate separation of construction activities and adjacent live carriageways
Implement safety measures when working in excavations, confined spaces and traffic areas
Implement appropriate safety measures when working around and over bodies of water and reed beds
Implement measures to protect all wildlife encountered, especially protected species.

MAINTENANCE / CLEANING

- As above

DECOMMISSIONING / DEMOLITION

- As above

It is assumed that all works will be carried out by a competent contractor working, where appropriate, to an approved method statement

Rev	Rev. Date	Purpose of revision	Drawn	Checkd	Rev'd	Apprv'd
P04	SEPT. 2019	PLANNING APPLICATION	WJ	MJ	MJ	PW
P03	AUG. 2019	EQ ALIGNMENT CHANGE	CP	MJ	SY	PW
P02	AUG. 2019	PLANNING	IK	MJ	SY	PW
P01	JUNE. 2019	ISSUE FOR CONSULTATION	CP	MJ	SY	PW

JACOBS
Cottons Centre, London, SE1 2QG
Tel:+44 (0)191 206 4115
www.jacobs.com

Client: Kent County Council

Project: Fastrack Full Network
Bean Road Tunnel

Drawing title: REFERENCE DESIGN
SITE CLEARANCE
Sheet 01 of 2

Drawing status: PLANNING APPLICATION

Scale	1:200 @ A1	DO NOT SCALE
Jacobs No.	B2350500	Rev P04
Client no.		

Drawing number: B2350500-JAC-DRG-HA-0004

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\\Lonfpp02\Proj\TTU Projects\Bean Road Tunnel\Design - Drawings\CAD\Highways\GEN\B2350500-JAC-DRG-HA-0004-5_Site clearance.dwg - 31/10/2019 17:52:49 - WEST - JoachiW

6.3. Appendix 3: BRT-TG-XX-ZZ-DR-LS-3001 ‘Landscape Plan Layout’

Ornamental Shrub Planting
2 no. Genista lydia
3 no. Hebe 'Green Globe'
3 no. Lavandula angustfolia 'Hidcote'
2 no. Santolina chamaecyparissus
1 no. Crataegus monogyana
1 no. Acer campestre
1 no. Quercus robur
1 no. Betula pendula
1 no. Alnus glutinosa
BUS ONLY
Ornamental Shrub Planting
2 no. Genista lydia
3 no. Hebe 'Green Globe'
3 no. Lavandula angustfolia 'Hidcote'
2 no. Santolina chamaecyparissus
1 no. Acer campestre
1 no. Crataegus monogyana
Ornamental Shrub Planting
4 no. Genista lydia
9 no. Hebe 'Green Globe'
11 no. Lavandula angustfolia 'Hidcote'
6 no. Santolina chamaecyparissus
BUS ONLY

KEY

Application Boundary

Existing Landscape

- Tree (retained)
  Refer to Drawing:
  JG18198 Topo 3D 01-02 'Topographical Survey'
- Tree (removed)
  Refer to drawing:
  B2350500-JAC-DRG-HA-0004-0005 'Site Clearance'

Proposed Landscape

- Trees
  Refer to report: BRT-TG-XX-ZZ-SH-LS-300 'Written landscape Specification' for full planting specifications and schedules
- Ornamental Shrub Planting
  Refer to report: BRT-TG-XX-ZZ-SH-LS-300 'Written landscape Specification' for full planting specifications and schedules
- Amenity Grass Seeding
- Wildflower Meadow Seeding
- Wetland/Pond Meadow Seeding
- Hard Landscaping
- Gabion Wall

RESIDUAL HAZARD	SUGGESTED CONTROL MEASURE

SIGNIFICANT RESIDUAL HAZARDS

NOTE: The above hazards do not include every hazard or assumption, but identify significant residual construction hazards that are not likely to be obvious to a competent contractor and those that could be difficult to manage effectively. Refer also to the designer's risk documentation.

DO NOT SCALE FROM THIS DRAWING

NOTES

The following drawings and reports should be read in conjunction with the design drawing:

- BRT-TG-XX-ZZ-SP-LS-3000 'Written Landscape Specification';
- BRT-TG-XX-ZZ-M2-HE-601 - Earthworks
- BRT-TG-XX-ZZ-M2-HE-602 - Earthworks Cross Section
- BRT-TG-XX-ZZ-M2-HI-021 - Location Plan
- BRT-TG-XX-ZZ-M2-HI-0101 - Highway Alignment Plan
- BRT-TG-XX-ZZ-M2-HI-0501 - Drainage Plan
- BRT-TG-XX-ZZ-M2-HI-0701 - Pavement Plan
- BRT-TG-XX-ZZ-M2-HI-1101 - Kerbs and Footways Plan
- BRT-TG-XX-ZZ-M2-HI-1201 - Traffic Signs Plan
- BRT-TG-XX-ZZ-M2-HI-1202 - Road Markings Plan
- BRT-TG-XX-ZZ-M2-HI-1203 - Traffic Signs Plan
- BRT-TG-XX-ZZ-DR-HI-0301 - Fencing Plan
- B2350500-JAC-DRG-HA-0004-0005 - Site Clearance Plan
- JG18198 Topo 3D 01-02 - Topographical Survey

Note the following information:

For hard landscaping and gabion wall details including construction build-up, levels and specification refer to project engineers construction details.

All existing tree information including crown spread is provided in the topographical survey JG18198 Topo 3D 01-02 RevD

REV.	BY	CHK'D	APP'D	DATE	DESCRIPTION
P01	JC	LH	JC	06/04/21	FIRST ISSUE

CODE	DRAWING STATUS

Tony Gee
www.tonygee.com
Consulting Engineers

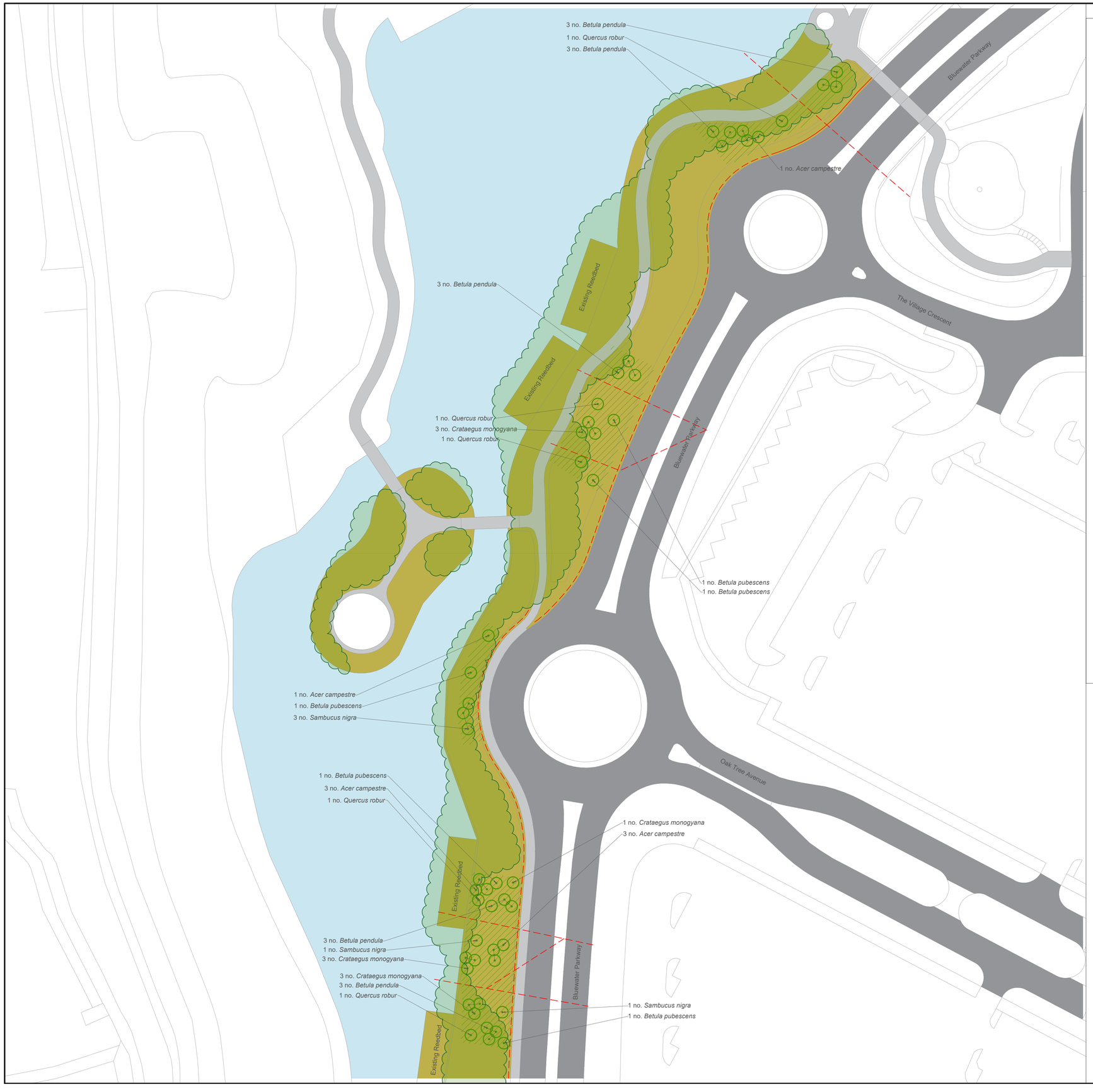
BEAN TUNNEL
TUNNEL AND HIGHWAY
DETAILED DESIGN

LANDSCAPE
PLAN LAYOUT

DRAWING. No.
BRT-TG-XX-ZZ-DR-LS-3001

DRAWN : JC	DESIGNED : JC	REVISION
SCALE : 1:100 @ A1	ORIGINAL SIZE : A1	P01

6.4. Appendix 4: BRT-TG-XX-ZZ-DR-LS-3002 ‘Lake 5 Landscape Plan Layout’



KEY

Existing Landscape

- Tree (retained)
- Amenity Grass
- Pond
- Hard Landscaping
- Existing Services
  Extent and locations to be determined on site by Landscape Contractor

Proposed Landscape

- Trees
  Refer to report: BRT-TG-XX-ZZ-SH-LS-300 'Written landscape Specification' for full planting specifications and schedules

RESIDUAL HAZARD	SUGGESTED CONTROL MEASURE

SIGNIFICANT RESIDUAL HAZARDS

NOTE: The above hazards do not include every hazard or assumption, but identify significant residual construction hazards that are not likely to be obvious to a competent contractor and those that could be difficult to manage effectively. Refer also to the designer's risk documentation.

DO NOT SCALE FROM THIS DRAWING

NOTES

- All existing tree information including crown spread has been taken from aerial imagery.
- All locations of existing services have been provided by Bluewater management and are shown on drawing PL-LAKE5 - 11.05.2021.
- Landscape contractor is responsible for locating all existing services on site and agreeing easements with asset owners prior to undertaking works.

REV.	BY	CHK'D	APP'D	DATE	DESCRIPTION
P01	JC	LH	JC	23.06.21	FIRST ISSUE

CODE	DRAWING STATUS

Tony Gee
www.tonygee.com
Consulting Engineers

Kent County Council kent.gov.uk
Balfour Beatty

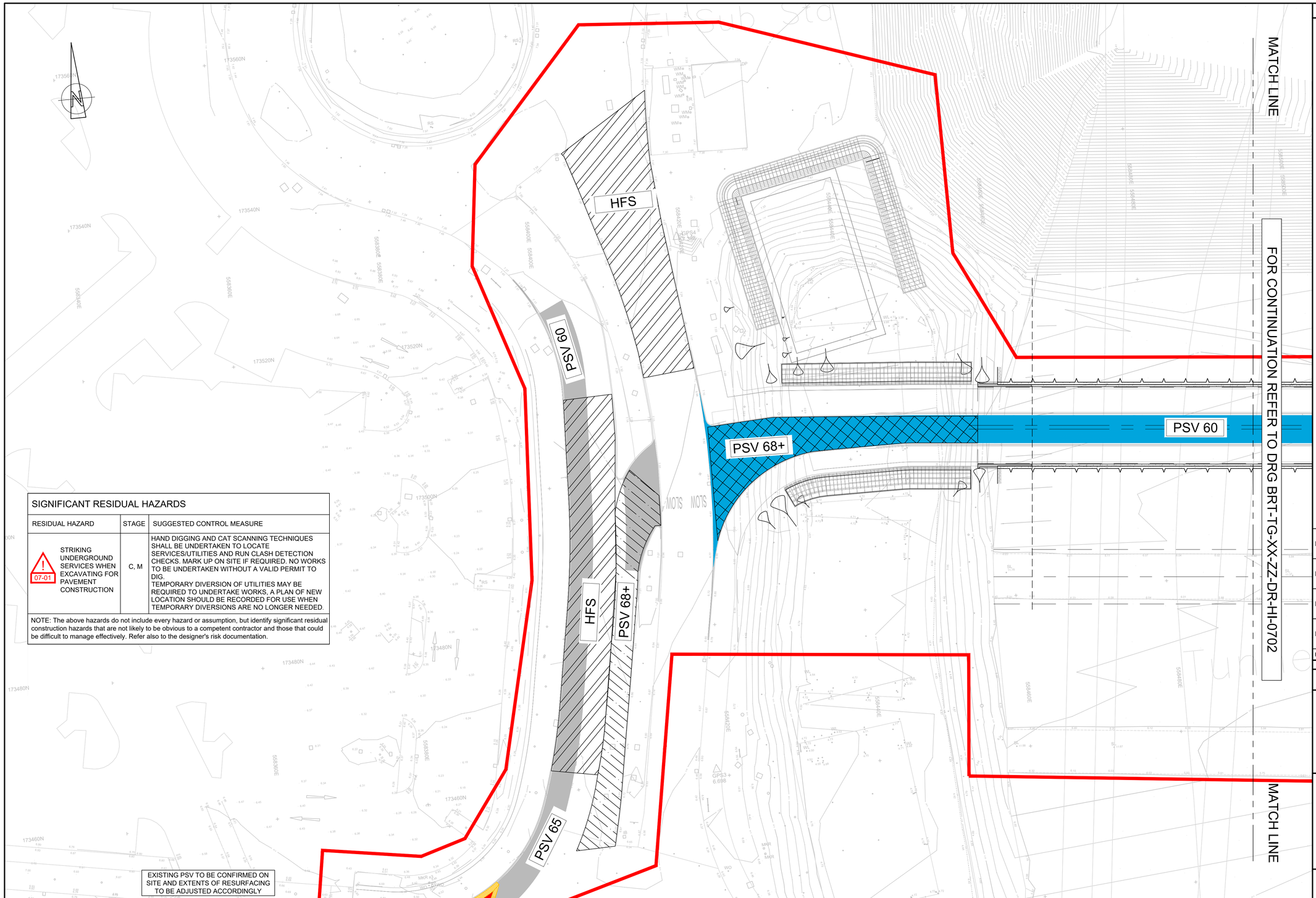
BEAN TUNNEL
TUNNEL AND HIGHWAY
DETAILED DESIGN

LAKE 5
LANDSCAPE PLAN LAYOUT

DRAWING. No.
BRT-TG-XX-ZZ-DR-LS-3002

DRAWN : JC	DESIGNED : JC	REVISION
SCALE : 1:500 @ A1	ORIGINAL SIZE : A1	P01

6.5. Appendix 5 BRT-TG-XX-ZZ-DR-HI-0701 'Highways Pavement Plan Layout'



SIGNIFICANT RESIDUAL HAZARDS

RESIDUAL HAZARD	STAGE	SUGGESTED CONTROL MEASURE
07-01 STRIKING UNDERGROUND SERVICES WHEN EXCAVATING FOR PAVEMENT CONSTRUCTION	C, M	HAND DIGGING AND CAT SCANNING TECHNIQUES SHALL BE UNDERTAKEN TO LOCATE SERVICES/UTILITIES AND RUN CLASH DETECTION CHECKS. MARK UP ON SITE IF REQUIRED. NO WORKS TO BE UNDERTAKEN WITHOUT A VALID PERMIT TO DIG. TEMPORARY DIVERSION OF UTILITIES MAY BE REQUIRED TO UNDERTAKE WORKS. A PLAN OF NEW LOCATION SHOULD BE RECORDED FOR USE WHEN TEMPORARY DIVERSIONS ARE NO LONGER NEEDED.

NOTE: The above hazards do not include every hazard or assumption, but identify significant residual construction hazards that are not likely to be obvious to a competent contractor and those that could be difficult to manage effectively. Refer also to the designer's risk documentation.

5m 0 5m 10m 15m 20m 25m
SCALE 1:250

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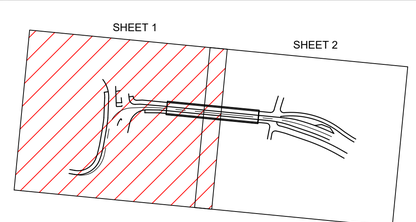

KEY PLAN

DO NOT SCALE FROM THIS DRAWING

NOTES

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE
2. ALL LEVELS ARE IN METRES AOD UNLESS NOTED OTHERWISE.
3. TO BE READ IN CONJUNCTION WITH DRAWING NO. BRT-TG-XX-ZZ-DR-HI-0702, BRT-TG-XX-ZZ-DR-HI-0711 AND SPECIFICATION BRT-TG-XX-ZZ-SP-HI-0700
4. FOR DETAILS ON FOOTWAYS AND OTHER PAVED AREAS REFER TO DRAWINGS NO. BRT-TG-XX-ZZ-DR-HI-1101, -1102 AND -1111.
5. ALL MATERIAL WITHIN 450mm OF FINISHED ROAD LEVEL SHALL BE NON-FROST SUSCEPTIBLE
6. WHERE NEW PAVEMENT IS THINNER THAN EXISTING, FORMATION SHALL BE SHAPED TO FALL AWAY FROM EXISTING PAVEMENT. OTHERWISE LAYERS SHALL MATCH
7. LONGITUDINAL JOINTS SHALL BE LOCATED TO AVOID THE WHEEL TRACK ZONE IN ACCORDANCE WITH SHW CLAUSE 903.21
8. SOFT SPOTS (<2.5% CBR) SHALL BE IDENTIFIED ON SITE AND THE EXTENT AGREED WITH THE DESIGNER. THE SUB FORMATION IN THESE AREAS TO CONSIST OF A GEOTEXTILE SEPARATION MEMBRANE TO APPENDIX 6/5 AND TREATMENT AS DEFINED IN TABLE 2

LEGEND

- SITE BOUNDARY
- PAVEMENT OPTION A - BLUEWATER PARKWAY
- PAVEMENT OPTION B - LIME TREE AVENUE
- PAVEMENT OPTION C - FASTRACK ROUTE
- BLUE SURFACE TREATMENT (PSV 68+)
- RED SURFACE TREATMENT (PSV 68+)
- HIGH FRICTION SURFACE - BLACK
- CONCRETE PAVING SETTS - TO MATCH EXISTING

REV.	BY	CHK'D	APP'D	DATE	DESCRIPTION
P04	GKC	LD	MJH	11/06/21	HATCH REMOVED. LEGEND NOTE UPDATED.
P03	AMG	LD	MJH	21/05/21	HATCHES AMENDED. EXISTING PSV NOTE ADDED.
P02	MS	LD	MJH	31/03/21	BW COMMENTS ADDRESSED
P01	MS	LD	MJH	15/01/21	FIRST ISSUE

CODE	DRAWING STATUS
S4	FOR STAGE APPROVAL

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Kent County Council kent.gov.uk

Balfour Beatty

BEAN TUNNEL
TUNNEL AND HIGHWAY DETAILED DESIGN

HIGHWAYS PAVEMENT PLAN LAYOUT

SHEET 1 OF 2

DRAWING. No.
BRT-TG-XX-ZZ-DR-HI-0701

DRAWN : BPH	DESIGNED : MS	REVISION
SCALE : 1:250	ORIGINAL SIZE : A1	P04

6.6. Appendix 6: BRT-TG-XX-ZZ-DR-HI-1101 ‘Highways Kerbs and Footway Plan Layout’

DO NOT SCALE FROM THIS DRAWING

NOTES

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE
2. ALL LEVELS ARE IN METRES AOD UNLESS NOTED OTHERWISE.
3. TO BE READ IN CONJUNCTION WITH SPECIFICATION REF BRT-TG-XX-ZZ-SP-HI-1100 AND WITH TYPICAL DETAIL DRAWING REF BRT-TG-XX-ZZ-DR-HI-1111.
4. FOR KERBS AND EDGINGS INSTALLATION DETAILS REFER TO STANDARD DRAWING KCC-HTW-1100-001.

LEGEND

- SITE BOUNDARY
- HB2 - HALF BATTERED KERB,125 UPSTAND
- TDK - TRANSITION KERBS FROM TRIEF KERB TO HB2/CONSERVATION KERB
- TK - TRIEF KERB
- BN - BULLNOSED KERB, 0-6mm UPSTAND AT PEDESTRIAN CROSSINGS
- EF - FLAT TOP CONCRETE EDGING
- DK - DROPPER KERB
- FOOTWAY/CYCLEWAY CONSTRUCTION
- TACTILE CORDUROY PAVING (BUFF)
- TACTILE BLISTER PAVING (BUFF)
- TACTILE BLISTER PAVING (RED)

MATCH LINE

FOR CONTINUATION REFER TO DRG BRT-TG-XX-ZZ-DR-HI-1102

MANHOLE COVER TO BE PARTIALLY SURFACED WITH TACTILE PAVEMENT SURFACING AS IT IS LOCATED AT THE TOUCAN CROSSING

END OF SHARED FOOTWAY/CYCLEWAY

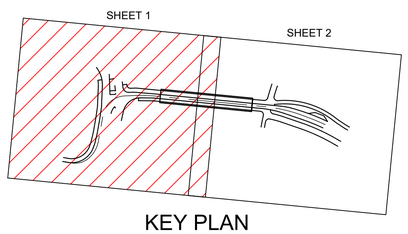
FOOTWAY AND KERBS TO TIE IN WITH EXISTING

MATCH LINE

SIGNIFICANT RESIDUAL HAZARDS

RESIDUAL HAZARD	STAGE	SUGGESTED CONTROL MEASURE
11-01 STRIKING UNDERGROUND SERVICES WHEN EXCAVATING FOR KERBS, FOOTWAYS AND PAVEMENT CONSTRUCTION	C, M	HAND DIGGING AND CAT SCANNING TECHNIQUES SHALL BE UNDERTAKEN TO LOCATE SERVICES/UTILITIES AND RUN CLASH DETECTION CHECKS. MARK UP ON SITE IF REQUIRED. NO WORKS TO BE UNDERTAKEN WITHOUT A VALID PERMIT TO DIG. TEMPORARY DIVERSION OF UTILITIES MAY BE REQUIRED TO UNDERTAKE WORKS, A PLAN OF NEW LOCATION SHOULD BE RECORDED FOR USE WHEN TEMPORARY DIVERSIONS ARE NO LONGER NEEDED.
11-02 TRIPS AND FALLS AT TACTILE PAVEMENT ON TOUCAN CROSSING	O, M	SURFACE MOUNTED TACTILES ARE TO BE USED OVER THE EXISTING MANHOLE COVER LOCATED AT THE TOUCAN CROSSING TO MAKE IT FLUSH WITH THE SURROUNDING TACTILE SURFACE.

NOTE: The above hazards do not include every hazard or assumption, but identify significant residual construction hazards that are not likely to be obvious to a competent contractor and those that could be difficult to manage effectively. Refer also to the designer's risk documentation.



KEY PLAN

REV.	BY	CHK'D	APP'D	DATE	DESCRIPTION
P05	GKC	LD	MJH	11/06/21	LAYOUT UPDATED
P04	AMG	LD	MJH	21/05/21	UPDATED FOLLOWING KCC ITS TEAM COMMENTS
P03	MS	LD	MJH	31/03/21	UPDATED WITH HAZARD BOX
P02	MS	LD	MJH	19/02/21	UPDATED FOLLOWING KCC COMMENTS ON TOUCAN CROSSING
P01	MS	LD	MJH	23/11/20	FIRST ISSUE

CODE	DRAWING STATUS
S4	FOR STAGE APPROVAL

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Consulting Engineers

Kent County Council kent.gov.uk

Balfour Beatty

BEAN TUNNEL
TUNNEL AND HIGHWAY DETAILED DESIGN

HIGHWAYS KERBS AND FOOTWAY PLAN LAYOUT

SHEET 1 OF 2

DRAWING. No.
BRT-TG-XX-ZZ-DR-HI-1101

DRAWN : BPH	DESIGNED : MS	REVISION
SCALE : 1:250	ORIGINAL SIZE : A1	P05

6.7. Appendix 7: BRT-TG-XX-ZZ-DR-HI-0301 ‘Highways Fencing Plan layout’

DO NOT SCALE FROM THIS DRAWING

NOTES
1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE
2. ALL LEVELS ARE IN METRES AOD UNLESS NOTED OTHERWISE.
3. TO BE READ IN CONJUNCTION WITH DRAWING NO. BRT-TG-XX-ZZ-DR-HI-0302, BRT-TG-XX-ZZ-DR-HI-0311 AND BRT-TG-XX-ZZ-SP-HI-0300.
4. CHAINLINK FENCE TO MATCH EXISTING AND TO COMPLY WITH REQUIREMENTS LISTED IN HCD H11

LEGEND

- SITE BOUNDARY
- PROPOSED GUARDRAIL VERTICAL BAR INFILL
- PROPOSED WOODEN POST AND RAIL (H15)
- PROPOSED CHAIN LINK (H11)
- EXISTING FENCE TO BE RETAINED / REINSTATED
- EXISTING FENCE TO BE REMOVED

MATCH LINE

FOR CONTINUATION REFER TO DRG BRT-TG-XX-ZZ-DR-HI-0302

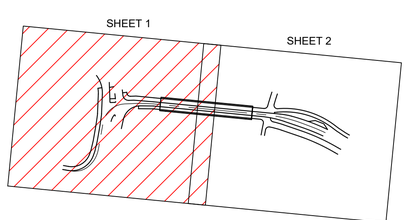
MATCH LINE

PROPOSED TUNNEL PORTAL

SIGNIFICANT RESIDUAL HAZARDS

RESIDUAL HAZARD	STAGE	SUGGESTED CONTROL MEASURE
03-01 STRIKING UNDERGROUND SERVICES WHEN EXCAVATING FOR FENCE POST INSTALLATION	C, M	SOME OF THE PROPOSED FENCING RUNS ABOVE EXISTING UNDERGROUND UTILITIES, WHICH MAY POSE A HAZARD TO OPERATORS DURING FENCE INSTALLATION, DEPENDING ON THE DEPTH OF THE UTILITIES. HAND DIGGING AND CAT SCANNING TECHNIQUES SHALL BE UNDERTAKEN TO LOCATE SERVICES/UTILITIES AND RUN CLASH DETECTION CHECKS. MARK UP ON SITE IF REQUIRED. NO WORKS TO BE UNDERTAKEN WITHOUT A VALID PERMIT TO DIG. TEMPORARY DIVERSION OF UTILITIES MAY BE REQUIRED TO UNDERTAKE WORKS, A PLAN OF NEW LOCATION SHOULD BE RECORDED FOR USE WHEN TEMPORARY DIVERSIONS ARE NO LONGER NEEDED.

NOTE: The above hazards do not include every hazard or assumption, but identify significant residual construction hazards that are not likely to be obvious to a competent contractor and those that could be difficult to manage effectively. Refer also to the designer's risk documentation.



KEY PLAN

REV.	BY	CHK'D	APP'D	DATE	DESCRIPTION
P04	GKC	LD	MJH	11/06/21	LAYOUT & TEXT NOTES UPDATED
P03	AMG	LD	MJH	21/05/21	TRAFFIC ISLAND AND EARTHWORKS AMENDED
P02	MS	LD	MJH	31/03/21	CHANGES FOLLOWING GABION WALL DESIGN
P01	MS	LD	MJH	01/02/21	FIRST ISSUE

CODE	DRAWING STATUS
S4	FOR STAGE APPROVAL

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BEAN TUNNEL
TUNNEL AND HIGHWAY DETAILED DESIGN

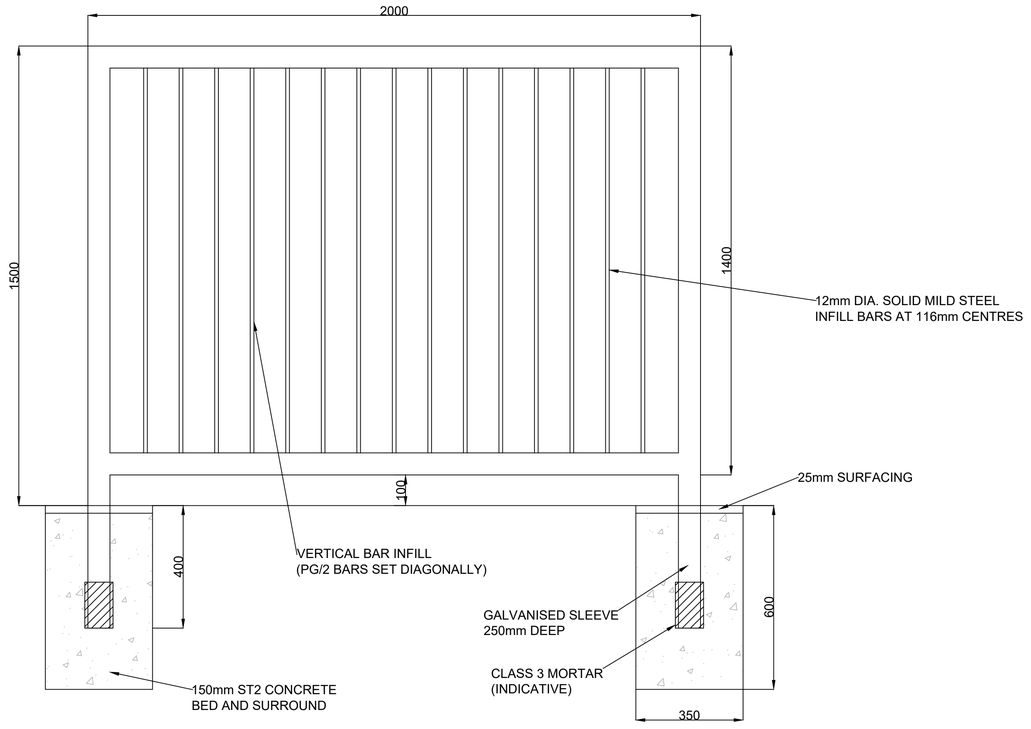
HIGHWAYS FENCING PLAN LAYOUT

SHEET 1 OF 2

DRAWING. No.
BRT-TG-XX-ZZ-DR-HI-0301

DRAWN : BPH	DESIGNED : MS	REVISION
SCALE : 1:250	ORIGINAL SIZE : A1	P04

6.8. Appendix 8: BRT-TG-XX-ZZ-DR-HI-0311 'Highways Fencing Details'



PEDESTRIAN GUARDRAIL STANDARD PANEL TYPE PG/1 & PG/2

200mm 0 200mm 400mm 600mm 800mm 1000mm
SCALE 1:10

DO NOT SCALE FROM THIS DRAWING

NOTES

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE
2. ALL LEVELS ARE IN METRES AOD UNLESS NOTED OTHERWISE.
3. TO BE READ IN CONJUNCTION WITH DRAWING NO. BRT-TG-XX-ZZ-DR-HI-0301, BRT-TG-XX-ZZ-DR-HI-0302 AND BRT-TG-XX-ZZ-SP-HI-0300.
4. FOR FENCE DETAILS AT REMAINING LOCATIONS PLEASE REFER TO MCHW VOLUME 3 - HIGHWAYS CONSTRUCTION DETAILS - H SERIES DWG NO. H15.

REV.	BY	CHK'D	APP'D	DATE	DESCRIPTION
P01	MS	LD	MJH	01/02/21	FIRST ISSUE

CODE	DRAWING STATUS
S3	FOR REVIEW/COMMENT

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BEAN TUNNEL
TUNNEL AND HIGHWAY
DETAILED DESIGN

HIGHWAYS
FENCING
DETAILS

DRAWING. No.
BRT-TG-XX-ZZ-DR-HI-0311

DRAWN : BPH	DESIGNED : MS	REVISION
SCALE : AS SHOWN	ORIGINAL SIZE : A1	P01